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| **ME102** | **Engineering Mechanics: 31/1/2017** | | | **Quiz 2** | |
| 1. A collar B of weight W can move freely along the vertical rod shown in Figure 1. The constant of the spring is k, and the spring is unstretched when =0. 2. Derive an equation in , *W*, *k*, and *l* that must be satisfied when the collar is in equilibrium. **[1.5]** 3. Knowing that *W*=300 N, *l*=500 mm, and *k*=800 N/m, determine the value of corresponding to equilibrium. **[1.5]** 4. A thin, homogeneous wire is bent to form the perimeter of the Figure 2. 5. Locate the center of gravity of the wire thus formed.   **[1.5]**   1. Locate the centroid assuming that the image shown in Figure 2 is a plane area. **[1.5]** 2. Determine the volume and the surface area of the solid obtained by rotating the plane area in (b) about the line y = 60 mm. **[4]** | | Figure 1 | Figure 2 | |

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